



**2020-2022 Mobile STEM Laboratory Grant Program**  
**Letter of Interest (LOI) Application Due 5:00 p.m. CT, March 19, 2020**

NOGA ID

Authorizing legislation **General Appropriations Act, Article III, Rider 81, 86th Texas Legislature**

This LOI application must be submitted via email to [loiapplications@tea.texas.gov](mailto:loiapplications@tea.texas.gov).

The LOI application may be signed with a digital ID or it may be signed by hand. Both forms of signature are acceptable.

TEA must receive the application by **5:00 p.m. CT, March 19, 2020**.

Application stamp-in date and time

Grant period from **June 1, 2020 to May 31, 2022**

Pre-award costs permitted from **the date of the award announcement**

**Required Attachments**

- Excel workbook with the grant's budget schedules (linked along with this form on the TEA Grants Opportunities page)
- All attachments as listed on page 4 of the Program Guidelines.

**Amendment Number**

Amendment number (For amendments only; enter N/A when completing this form to apply for grant funds):

**Applicant Information**

Organization  CDN  Campus  ESC  DUNS

Address  City  ZIP  Vendor ID

Primary Contact  Email  Phone

Secondary Contact  Email  Phone

**Certification and Incorporation**

I understand that this application constitutes an offer and, if accepted by TEA or renegotiated to acceptance, will form a binding agreement. I hereby certify that the information contained in this application is, to the best of my knowledge, correct and that the organization named above has authorized me as its representative to obligate this organization in a legally binding contractual agreement. I certify that any ensuing program and activity will be conducted in accordance and compliance with all applicable federal and state laws and regulations.

I further certify my acceptance of the requirements conveyed in the following portions of the LOI application, as applicable, and that these documents are incorporated by reference as part of the LOI application and Notice of Grant Award (NOGA):

- LOI application, guidelines, and instructions
- Debarment and Suspension Certification
- General and application-specific Provisions and Assurances
- Lobbying Certification

Authorized Official Name  Title

Email  Phone

Signature  Date

**Shared Services Arrangements**

Shared services arrangements (SSAs) are **not** permitted for this grant.

**Statutory/Program Assurances**

The following assurances apply to this program. In order to meet the requirements of the program, the applicant must comply with these assurances.

Check each of the following boxes to indicate your compliance.

- 1. The applicant provides assurance that program funds will supplement (increase the level of service), and not supplant (replace) state mandates, State Board of Education rules, and activities previously conducted with state or local funds. The applicant provides assurance that state or local funds may not be decreased or diverted for other purposes merely because of the availability of these funds. The applicant provides assurance that program services and activities to be funded from this LOI will be supplementary to existing services and activities and will not be used for any services or activities required by state law, State Board of Education rules, or local policy.
- 2. The applicant provides assurance that the application does not contain any information that would be protected by the Family Educational Rights and Privacy Act (FERPA) from general release to the public.
- 3. The applicant provides assurance to adhere to all the Statutory and TEA Program requirements as noted in the 2020-2022 Mobile STEM Laboratory Grant Program Guidelines.
- 4. The applicant provides assurance to adhere to all the Performance Measures, as noted in the 2020-2022 Mobile STEM Laboratory Program Guidelines, and shall provide to TEA, upon request, any performance data necessary to assess the success of the program.

**Mobile STEM Laboratory**

- 5. The applicant will provide a Mobile STEM Laboratory that is fully equipped with a power source, technology, equipment, consumables, and lessons for educators to use with their students. Districts shall not be expected to provide any supplies (including perishable items) to complete activities in the Mobile STEM Laboratory or supply power for the Mobile STEM Laboratory.
- 6. The applicant assures a dedicated staff member will travel with the Mobile STEM Laboratory to lead activities with the students and model how a STEM lesson is facilitated. The staff member shall model research based pedagogy and best practices.

**Data Collection**

- 7. The applicant will develop a survey for the district/campus to complete that includes but is not limited to information about the students who used the labs, including student demographic information, gender, and effectiveness of the mobile lab.
- 8. The applicant provides assurance pre and post-test assessments will accompany each activity.
- 9. The applicant provides assurance a data collection system will be developed to analyze the data collection and generate monthly reports including assessment data, survey information, and highlights from each visit.

**Safety**

- 10. The applicant assures proper safety measures will be in place to ensure safety while students are working in the Mobile STEM Laboratory.
- 11. The applicant assures safety equipment will be provided for activities according to the Texas Safety Standards Laws and Rules. For more information, please click here: <https://tea.texas.gov/sites/default/files/Safety%20Laws%20and%20Rules%202016.pdf>

**Activities**

- 12. The applicant assures the Mobile STEM Laboratory will contain STEM activities for K-8th grade that integrate content knowledge aligned to the TEKS and approved by TEA prior to use.

**Program Assurances (Continued)**

**Activities (Continued)**

- 13. The applicant assures all STEM activities will include the engineering design process so that students are designing a product or process during the activity and will not focus on content in silos. Activities must be approved by the TEA prior to use.
- 14. The applicant assures the length of activities for K-2 will be 20-30 minutes and 3-8 will be 45-60 minutes.
- 15. The applicant assures activities, materials and a flyer will be provided to encourage campuses to host a community night where families and community members are invited to visit and engage in a community design challenge using the Mobile STEM Laboratory.

**Capacity**

- 16. The applicant assures the Mobile STEM Laboratory will serve all 20 educational regions during each year of operation.
- 17. The applicant assures that each region will be allowed to have access to the Mobile STEM Laboratory at least one time during the grant period to allow for maximum coverage of the state.
- 18. The applicant assures the Mobile STEM Laboratory will be stocked with enough materials and equipment for at least 25 students to participate at the same time and extra supplies available so that activities can be restocked and used for the entire grade level. The applicant will use AskTED (<http://mansfield.tea.state.tx.us/tea.askted.web/Forms/Home.aspx>) and review the enrollment data to ensure the Mobile STEM Laboratory is stocked with enough supplies to accommodate the district being served.

**Marketing/Communication**

- 19. The applicant will provide to the TEA a marketing plan to spread awareness of the Mobile STEM Laboratory throughout the state including how information will be distributed to districts, examples of brochures, flyers, and other marketing materials, and how rural and high needs districts will be targeted. The marketing plan will be presented to the TEA for approval.
- 20. The applicant assures a dedicated website to the Texas Mobile STEM Laboratory will be available for districts to apply for access to the Mobile STEM Laboratory.
- 21. The applicant assures an application process as well as an application will be developed for districts to apply to access the Mobile STEM Laboratory. The application must request information that will help the determine needs such as a high number of students who are living in poverty, English learners, or who live in a rural area.
- 22. The applicant assures they will communicate with the TEA the delivery locations and point of contact at each location prior to the program start date to ensure all regions in Texas are being served.
- 23. The applicant will provide the TEA a monthly report including highlights from each visit and pictures that will be used to spotlight the Mobile STEM Laboratory in the state STEM newsletter.
- 24. The applicant assures all students will sign permission slips to participate in STEM activities and have signed waivers or pictures of students that are shared with the TEA.

**Cost**

- 25. The applicant assures the Mobile STEM Laboratory will be provided to districts at no cost. Title 1 schools that have a high number of students living in poverty, who are English learners, or who live in a rural area shall have priority placement in the Mobile STEM Laboratory.

**Qualifications and Experience for Key Personnel**

Provide the qualifications and experience of key personnel as described on page 7 of the Program Guidelines.

**Title and Responsibilities of Position**

**Required Qualifications and Experience**

Jennifer Colvin - VP of Education - Project Director/Administrator/P.I.; will direct the overall project throughout the duration of the contract  
 Tori Bishop & Desurae Matthews - Education Coordinators; Mobile Lab Instructors  
 James Hong, M.Ed. - Instructional Designer

Jennifer provides strategic direction of educational programs and new initiatives. Jennifer has developed seven mobile laboratory programs has extensive experience developing and delivering science education programs for students and professional development workshops for educators. Jennifer scientific background includes genomics and DNA sequencing research, development and quality control experience.

**TEA Program Requirements**

1. Describe an understanding of prior work in STEM and research in running a Mobile STEM program(s). Specifically describe how the tasks will be performed and identify potential problems in the conduct of the project and methods to identify and solve such problems.

Since 2003 Learning Undeclared has engaged more than 200,000 students in hands-on STEM curriculum across 18 states. Learning Undeclared has a proven track record of success in improving students' STEM attitudes and content knowledge while increasing interest in STEM careers. Recent program evaluations showed that after participating in its Mobile STEM Lab Program, 66% of students reported increased their knowledge of scientific data and measurements, 64% reported increased interest in attending college, and 40% of students reported increased interest in pursuing a STEM career. Learning Undeclared has a long track record in the successful implementation of mobile laboratories in multiple states; developing, testing and honing its unique and broad program offerings. Seasoned education staff have the necessary expertise and experience to design and deploy this program, including diverse backgrounds in science and/or education, and many possess advanced science or education degrees. Learning Undeclared is a founding member of the Mobile Laboratory Coalition, a partnership of mobile science laboratory programs supporting each other through evaluation, best practices, and curriculum share. Learning Undeclared will bring one of its Mobile STEM Labs to schools for one week visits in each of the 20 educational regions. Schools will be selected for visits based on need. Each visit will incorporate TEKS-aligned curriculum and hands-on STEM activities both in the lab and in the classroom for grades K-8. A potential challenge will be to ensure each educational region is served during each school year utilizing one Mobile STEM Lab. We plan to overcome this challenge by having a second Mobile STEM Lab available to deploy as needed to be able to cover the necessary footprint across the state.

2. Describe clearly, specifically, and as completely as possible, the methodology for carrying out the objectives and requirements of the Mobile STEM Laboratory as described in Program Guidelines.

Learning Undeclared will work with cohorts of educators and STEM industry subject matter experts (SMEs) to develop dynamic and compelling standards-based STEM activities for use on the Texas Mobile STEM Laboratory. Using TEKS as guidance, educators and SMEs will focus on aligning activities and instruction. The activities will be provided to TEA to offer feedback and final approval before use on the Mobile Laboratory. Formative and summative evaluations will be used to measure the impact of the program on teacher and student achievement, attitudes and confidence levels towards STEM topics and techniques, and awareness of STEM careers. Outcomes are measured and evaluated using a variety of methods that may include classroom observation, focus groups, interviews, and pre/post surveys. Learning Undeclared also collects and tracks data on the reach of its programs, including number of students served, demographics, and percentage of those that qualify as high need. The Texas Mobile STEM Laboratory is a custom outfitted STEM learning space that offers engaging, immersive, hands-on STEM experiences for students and teachers, teaching science, technology, engineering and mathematics topics and skills. Onboard the Lab, students are immersed in a self-directed career exploration experience using augmented reality and game-based learning, taking them on a multisensory immersive journey as they explore high-demand STEM careers. The Lab transports activity resource carts for in-classroom, hands-on learning and STEM activities for students in grades K-8. Teachers and/or administrators may request a visit for their school beginning July 1 for the following school year. All Texas public schools that offer classes for grades K-8 are eligible to request a visit. At least one school from every education district will receive a visit each school year. Priority for visits will be given to schools in rural areas and those demonstrating high economic need (majority student body that qualifies for free & reduced meals). In subsequent years, priority will also be given to schools that have not yet had a Mobile STEM Lab visit. A visit is typically one week long but may be extended to two weeks if the school has more than 500 students. Classroom teachers will have access to curriculum, resources, equipment, and on-site support from Mobile Laboratory staff to present the TEA approved STEM activities in their classrooms. At the same time, smaller groups of up to 15 students will participate in the 20-minute immersive learning experience onboard the Mobile Laboratory. This model allows us to serve up multiple classes of students simultaneously.

**Program Requirements (Cont'd)**

3. Describe the project design, project activities, materials, and other products, services, and reports to be generated during the grant period and relate them to the stated purposes and specifications as described in the Program Guidelines.

Through the Mobile STEM Lab Program, Learning Undefeated will utilize its Texas Mobile STEM Laboratories to serve schools (grades K-8) in each of the 20 educational regions of Texas during the 2020-2021 and 2021-2022 school years. The Labs, which will be available to eligible schools at no cost, will include laboratory equipment and supplies for hands-on investigation to be used by teachers both in the Lab and in the classroom with age-appropriate, TEKS-aligned curricula.

All activities will be designed to engage students in STEM design-based challenges, increase content knowledge, raise awareness of STEM careers, and demonstrate the engineering design process. Activities will also promote the STEM Fluency Skills (such as communication, collaboration, creativity, critical thinking, etc.). Examples of the activity topics include engineering, computer science, biology, cybersecurity, physics, genetics, physiology, earth sciences, virtual reality, forensics, and others. Details of sample activities along with appropriate TEKS alignment and grade level can be found on the attachment " Sample STEM Activities. "

The following sample program goals and outcomes will be incorporated and measured (full proposed list attached):

Goal 1: Increase the number of K-8 grade students who can engage in STEM design-based challenges aligned to the content they are learning in class.

Outcome 1: At least one school in each of the 20 education districts will have a Lab visit annually (majority high need)

Outcome 2: At least 75% of students evaluated will demonstrate an increase in STEM content knowledge

Goal 2: Raise awareness among participating K-8 grade students for high wage, high demand STEM careers in Texas while promoting STEM Fluency Skills.

Outcome 3: At least 75% of students evaluated will demonstrate an increase in awareness of STEM careers

Goal 3: Increase teacher experience and confidence with STEM concepts and techniques

Outcome 4: At least 70% of STEM teachers evaluated will use one or more of the Lab's resources during the visit

4. Describe the comprehensive project plan, which must serve each Educational Region of Texas. Include and clearly describe tasks, activities major milestones, and products/projects as well as demonstrate the expertise, experience, and capacity to evaluate, develop, deliver, and curate specific instructional materials and resources for all aspects of the project.

Learning Undefeated will serve all 20 educational regions, bringing one of its Mobile STEM Labs to schools for one-week visits. Priority for visits will be given to schools in rural areas and those demonstrating high economic need (majority student body that qualifies for free & reduced meals). So as to ensure that each of the educational regions receive at least one lab visit annually, a second Mobile STEM Lab will be available and utilized as needed.

The Texas Mobile STEM Laboratory is a custom outfitted STEM learning space built from a shipping container that has its own onboard power, HVAC and water system and is wheelchair accessible. It is transported on roll-back trucks to schools and other event locations. In order to market the program, we will leverage our extensive network of Texas teachers and schools already in place, as well as the Education Service Centers in each of the 20 regions. Partnering with ESCs will allow participation in teacher professional development opportunities as well as access to established communications channels in place for teachers and administrators. We will participate in statewide opportunities for teachers as needed (i.e. Science Teachers Association of Texas' CAST conference), where we can meet and share program details and opportunities.

Jennifer Colvin, Learning Undefeated's V.P. of Education, will oversee the project throughout the duration of the program. Ms. Colvin provides strategic direction of educational programs and new initiatives having overseen the development and implementation of six (6) mobile laboratory programs during her tenure with the organization. Two (2) Mobile Lab Instructors are responsible for teaching and presenting inquiry-based, hands-on, experiential learning curriculum and activities to students, both onboard the Lab and in the classroom. With ongoing support from the Program Manager, the instructors are responsible for scheduling and logistics for each school visit; teacher professional development and curriculum assistance; training and troubleshooting; taking inventory of equipment, supplies, reagents, etc. that are needed; keeping the lab stocked throughout the year and coordinating delivery; as well as traveling with the lab and ensuring proper maintenance upkeep is taking place on a continual basis and as needed.

**Program Requirements (Cont'd)**

5. Provide evidence of running a data driven project. Include how previous projects have been adapted based on data analysis.

Formative and summative evaluations are used to measure the impact of the program on teacher and student achievement, content knowledge, attitudes and confidence levels towards STEM topics, awareness of STEM careers, and interest in pursuing a STEM career. Outcomes are measured and evaluated using a variety of methods that may include classroom observation, focus groups (with students, teachers, subject matter experts, etc.), interviews, and pre/post surveys. Learning Undeclared also collects and tracks data on the reach of its programs, including number of students served, and percentage of those that qualify as high need.

Questions that Learning Undeclared may wish to answer through the Mobile STEM Lab Program include following:

- ++To what extent did the project increase the students' interest in technology and STEM careers?
- ++To what extent did the project increase students' STEM self-efficacy?
- ++To what extent did students acquire new knowledge about STEM?
- ++To what extent has Learning Undeclared extended its outreach efforts in local communities and school districts in underserved populations?

6. Provide a description of safety issues related to operating a Mobile STEM Laboratory. A safety plan must be attached to this application that includes assurance of the safety of Texas students while participating in the Mobile STEM Laboratory program.

Safety issues around the mobile laboratory involve laboratory and reagent safety, security measures around visitors, and emergencies, including weather, medical and student. Many safety issues aboard the lab are similar to those that schools face inside a standard classroom or school environment. Security measures and policies are used to identify individuals requesting to enter the vehicle and doors are locked from the outside. The laboratory team must also prepare for and work to prevent any discomfort students may experience in the unique, enclosed environment. To combat this, labs are designed to be well-ventilated, monitor air quality, allow easy access to entry and exit doors, and inform participants about what to expect prior to boarding. Laboratory safety and an understanding of the chemicals and reagents that are carried and transported aboard the lab should also be considered. All laboratory reagents are documented and accompanied with proper Material Safety Data Sheets (MSDS). The mobile laboratory also does not carry reagents above a Biosafety Level (BSL) 1 to limit the impact of any spills or accidents.

A safety plan is attached to this application.

**Program Requirements (Cont.)**

7. Describe how community events will be hosted and how the Mobile STEM Laboratory can connect to local communities in addition to serving the students in the schools.

A tremendous benefit that these Mobile STEM Laboratories provide is the opportunity to engage students, educators and community residents with hands-on experiential STEM learning and STEM career exploration right in their schools and in their communities. Bringing this resource directly to a community further strengthens the impact of school programming, and eliminates obstacles many families have around transportation and access. There are a multitude of different ways in which the program can engage the general community in the program. Examples include:

- ++Local community events can be coordinated and facilitated with the Mobile STEM Lab in TEA priority communities, on school campuses after school or in the evening hours. Educators as well as local STEM professionals would have opportunities to share their work and career path, helping bring awareness to the work that they do.
- ++In coordination with those schools we are serving, community STEM nights/events can be organized to engage local community, families, school leadership, stakeholders, elected officials, etc.
- ++Outreach to local STEM professionals in the community could take place to invite them to volunteer on the lab and in the classroom to help teach and support instructors, and also to expose students and teachers to their own STEM careers.
- ++Coordinate with industry partners to invite students and their families to visit facilities, take a tour, meet STEM professionals and learn about STEM careers and pathways

8. Describe the organization's current Mobile STEM Laboratory capacity. Include the number of Mobile STEM Laboratories the organization has, how they are transported, and how many students can be served with each mobile unit.

Learning Undefeated operates one of the most expansive, innovative, and successful Mobile STEM Laboratory Programs in the country, using custom-built mobile laboratories to bring hands-on STEM activities and curriculum to the parking lots of schools and to students living in under-resourced communities. Learning Undefeated's Mobile STEM Lab Program provides students with education opportunities to increase their awareness, knowledge, and interest in the field, focusing on serving students underrepresented in STEM. The curriculum meets the educational needs of teachers and students by providing proven hands-on and inquiry-based activities that meet state and national standards. Onboard the labs students learn by doing, using advanced equipment that they may not have access to in their school's laboratory. In addition to bringing critical STEM educational resources and opportunities to those that need them most, the mobile labs support Learning Undefeated's goals of building awareness of STEM careers, increasing diversity in the workforce, and building a pipeline of qualified professionals.

Learning Undefeated currently operates six (6) Mobile STEM Labs in four (4) regions of the country: two labs operating in Texas, two labs operating in Maryland and the Mid-Atlantic region, one lab operating in Louisiana, and now one lab about to begin operations in Puerto Rico. The two Texas-based Mobile STEM Labs are custom built shipping containers that have their own onboard power, HVAC and water system and are wheelchair accessible. They are transported on roll-back trucks to schools and other event locations. The Labs offer an immersive technology-rich teaching environment that uses augmented reality and game-based learning. The lab transports activity resource carts for in-classroom, hands-on learning and STEM activities for students, and the labs also offer temporary science and technology teaching space when needed (during disaster recovery, etc.). Teachers will have access to resources, equipment, and on-site support from Mobile Laboratory staff to present the TEA approved STEM activities in their classrooms. At the same time, smaller groups of up to 15 students will participate in the 20-minute immersive learning experience onboard the Mobile Laboratory. This model allows us to serve up to four classes of students simultaneously.

**Budget Narrative**

Describe how the proposed budget will meet the needs and goals of the program, including for staffing, supplies and materials, contracts, etc. If applicable, include a high-level snapshot of funds currently allocated to similar programs. Include a short narrative describing how adjustments will be made in the future to meet needs.

We are estimating the direct costs of the program to be \$297,596 annually (\$595,192 over the two-year period). Of this total program cost, our request through this grant application is for TEA funds to cover \$250K of these costs per year. The budget incorporates 20 weeks of lab visits to at least one school in each educational district. Learning Undefeated is committed to raising and/or providing the additional funds needed to cover the difference as well as to account for the necessary administrative costs associated with the program.

Learning Undefeated continues to grow and diversify its funding sources for future needs by seeking new funders from a diverse set of sectors, including corporations, foundations, federal and state government and higher education institutions. Learning Undefeated also maintains an investment portfolio that can serve as a reserve if needed.

**Payroll Costs (6100)**

Program management and administration includes the Vice President of Education (Project Director: 10% of 1 FTE), the Education Director (Project Coordinator: 10% of 1 FTE), and the Program Manager (Project Coordinator: 30% of 1 FTE). Academic/Instructional staff includes two Mobile Lab Instructors (Teachers: 100% of 2 FTE). Under Other Employee Positions we have included an Instructional Designer for curriculum development (25% of 1 FTE).

**Professional and Contracted Services (6200)**

A storage unit will be rented to keep Lab materials and supplies until needed (\$200 per month). Contracted flatbed semi-tractor trailer drivers deliver Labs to each location (\$1,550 per move) and AV support contractors (\$6,000 per year) provide ongoing technical support for the AV instructional components of the labs.

**Supplies and Materials (6300)**

Non-capitalized lab equipment includes items such as tube racks, beakers, safety goggles, mini Centrifuges, micropipettes, and other scientific supplies (\$10,00 per year). Reagents used include agar, buffers and gel stains (\$8,700 per year). Consumables are items such as pipet tips, nitrile gloves, culture tubes, and spill pads (\$23,000 per year). Materials and printing (\$1,350 per year) covers costs for student/teacher handouts and other instructional materials.

**Other Operating Costs (6400)**

This section includes local staff travel for instructors (mileage at \$36,638 per year[\$0.56/mile], lodging at \$26,838 per year, and per diems at \$11,722 per year[\$52/day]) and is based on visits to each of the 20 educational districts. Cloud computing facilitates program and instruction management and includes subscriptions for internet, Dropbox, Airtable, and Office365. Cell phones are used by instructors in the field and by students in conjunction with the VR equipment and related activities in the classroom (\$125 per month).

**Appendix I: Amendment Description and Purpose** (leave this section blank when completing the initial application for funding)

An amendment must be submitted when the program plan or budget is altered for the reasons described in the "When to Amend the Application" document posted on the [Administering a Grant](#) page. The following are required to be submitted for an amendment: (1) Page 1 of the application with updated contact information and current authorized official's signature and date, (2) Appendix I with changes identified and described, (3) all updated sections of the application or budget affected by the changes identified below, and, if applicable, (4) Amended Budget Request. Amendment Instructions with more details can be found on the last tab of the budget template.

*You may duplicate this page*

**Amended Section**

**Reason for Amendment**